AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1-2.   (Cancelled)

3.   (Currently Amended) ~~The apparatus for tracing GTP resource of claim 1~~ An apparatus for tracing GTP resource, comprising:

a call tracing unit for receiving a command of a call tracing from an operator through MMI and performing the call tracing;

a call tracing DB for storing call-tracing data currently processed;

a GTP-U tracing unit for tracing a GTP-U message and reporting the GTP-U message to the call tracing unit;

a SGSN interface unit for receiving the GTP-U message outputted from the SGSN; and

an internet interface unit for transmitting the GTP-U message routed at the GTP-U tracing unit to an internet network, wherein the GTP-U tracing unit comprises:

a call tracing interface unit for processing a GTP-U tracing function message requested from the call tracing unit and transmitting a result of the GTP-U data tracing;

a TEID converter for converting the IMSI or IP received from the call tracing interface unit to a TEID;

a trace load controller for minimizing a load of an exchanger, the load generated

from the GTP-U data tracing function;

a GTP-U traffic detector for detecting a traffic for tracing the GTP-U between the

SGSN interface unit and the internet interface unit; and

a GTP-U tracing DB for storing the IMSI information for mapping the TEID and

information for the GTP-U tracing.

4-8.   (Cancelled)

9.   (Currently Amended) ~~The method for tracing GTP resource of claim 4~~ A method for

tracing GTP resource, comprising:

setting a tracing function for reserved resources of a GTP-U by using a TEID for a

subscriber to be traced; and

outputting information for the reserved resource by detecting the GTP-U having the

tracing function set therein, wherein outputting said information for the reserved resource

information comprises:

receiving and storing the TEID related to the registration of the GTP-U tracing

function and the tracing information in a tracing information DB, and activating a tracing flag

corresponding to the TEID;

confirming a TEID of the GTP-U trafficked between the SGSN and the GGSN;

confirming whether the tracing flag corresponding to the confirmed TEID is activated by searching the TEID table; and

outputting the reserved resource information of the GTP-U to the operator by using the TEID.

10.   (Original) The method for tracing GTP resource of claim 9, wherein the reserved resource information comprises an AMA number of trafficked subscriber message, an interface number, a VPI/VCI, a link band, a value directing a stream direction of the data, and the trace count value.

11.   (Previously Presented) The method for tracing GTP resource of claim 9, wherein outputting the reserved resource information comprises:

confirming whether the TEID is stored by searching the tracing information DB;

mapping the reserved resource information to a subscriber tracing information corresponding to the TEID and outputting the mapped subscriber tracing information to the operator when the TEID is stored;

increasing a trace count value in the tracing information and comparing the trace count value with a trace critical value; and

deleting the TEID and the tracing information in the tracing information DB when the trace count value is the same as the trace critical value.

12-16. (Cancelled)

17.   (Currently Amended) ~~The method for tracing GTP resource of claim 16~~ A method for tracing GTP resource, the GTP trafficked between a SGSN and a GGSN at an exchanger including the SGSN and the GGSN having a call tracing unit, a call manager, a tracing information DB, and GTP-U tracing unit, comprising:

setting a tracing function for reserved resource of a GTP-U using TEID of a subscriber to be traced; and

detecting the GTP-U having the tracing function set therein and outputting information for the reserved resource of the GTP-U message, wherein setting the tracing function comprises:

requesting, by the call tracing unit, a GTP-U tracing function registration to the GTP-U tracing unit by transmitting a tracing information for a subscriber received from an operator to the GTP-U tracing unit;

mapping, by the GTP-U tracing unit, the TEID allotted to the subscriber using the tracing information;

registering, by the GTP-U tracing unit, the GTP-U tracing function using the TEID and transmitting the TEID to the call tracing unit; and

storing, by the call tracing unit, the TEID together with the tracing information in the tracing information DB.

18.   (Previously Presented) The method for tracing GTP resource of claim 17, further

comprising transmitting, by the GTP-U tracing unit, a response message to the request of the

GTP-U tracing function registration to the call tracing unit after said requesting.

19.   (Previously Presented) The method for tracing GTP resource of claim 18, further

comprising reporting, by the call tracing unit, a failure of the GTP-U tracing function

registration to the operator when there is no response message to the request of the GTP-U

tracing function registration from the GTP-U tracing unit within a predetermined time.

20.   (Previously Presented) The method for tracing GTP resource of claim 17, wherein

said mapping further comprises transmitting a response message for notifying a failure of the

GTP-U tracing function registration from the GTP-U tracing unit to the call tracing unit and

reporting the failure of the GTP-U tracing function registration from the call tracing unit to the

operator when the GTP-U tracing unit confirms that the call for the subscriber does not exist by

mapping the TEID allotted to the subscriber.

21.   (Original) The method for tracing GTP resource of claim 17, wherein the tracing

information comprises the IMSI and IP address of the subscriber.

22.   (Original) The method for tracing GTP resource of claim 21, wherein the tracing

information comprises 2bits indicating SGSN record type and a tracing type for classifying call

watching, call tracing, and GTP-U tracing according to the SGSN record type of the 2bits.

23.   (Original) The method for tracing GTP resource of claim 17, wherein the tracing

information DB stores the tracing information, the TEID, and a trace count value notifying the

number of the traced message.

24.   (Previously Presented) The method for tracing GTP resource of claim 17, wherein

said mapping comprises:

        converting the tracing information (INSI or IP) received from the call tracing unit

to the TEID and storing the converted TEID and the tracing information at the GTP-U tracing

unit; and

        activating a tracing flag corresponding to the TEID.

25.   (Currently Amended) ~~The method for tracing GTP resource of claim 16~~ A

method for tracing GTP resource, the GTP trafficked between a SGSN and a GGSN at an

exchanger including the SGSN and the GGSN having a call tracing unit, a call manager, a tracing

information DB, and GTP-U tracing unit, comprising:

        setting a tracing function for reserved resource of a GTP-U using TEID of a subscriber

to be traced; and

detecting the GTP-U having the tracing function set therein and outputting information for the reserved resource of the GTP-U message, wherein outputting the reserved resource information comprises:

confirming the TEID of a trafficked GTP-U at the GTP-U tracing unit;

confirming whether a tracing flag of the TEID is activated by searching the table with the confirmed TEID at the GTP-U tracing unit;

transmitting information for the reserved resource of the GTP-U together with the TEID from the GTP-U tracing unit to the call tracing unit when the tracing flag is activated; and

outputting the reserved resource information from the call tracing unit to the operator using the TEID.

26.   (Original) The method for tracing GTP resource of claim 25, wherein the reserved resource information comprises an AMA number of the trafficked GTP-U, an interface number, VPI/VCI, a link band, a value directing a stream direction of the data, and a trace count value.

27.   (Previously Presented) The method for tracing GTP resource of claim 25, wherein outputting the reserved resource information to the operator comprises:

confirming whether the TEID received from the GTP-U tracing unit is stored by searching the tracing information DB;

mapping a subscriber tracing information corresponding to the TEID with the reserved resource information and outputting the mapped resource information to the operator when the TEID is stored;

increasing a trace count value in the call tracing information and comparing the trace count value with a trace critical value; and

deleting the TEID and the tracing information from the tracing information DB when the trace count value is the same as the trace critical value.

28.   (Original) The method for tracing GTP resource of claim 27, wherein the comparison of trace count value and trace critical value is separately carried out for each of up stream and down stream, and the TEID and the tracing information are deleted from the tracing information DB when the trace count value of one of the up/down stream is the same as the trace critical value.

29.   (Previously Presented) The method for tracing GTP resource of claim 17, further comprising operating a timer corresponding to a tracing function duration at the call tracing unit when the TEID is received if the tracing information has information of the tracing function duration.

30.   (Previously Presented) The method for tracing GTP resource of claim 29, further comprising canceling the GTP-U tracing function by deleting the TEID and the tracing information from the tracing information DB when the timer is terminated.

31-32. (Cancelled)